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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JOHN T. STROM and RAYMOND H. KRAFT

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Appeal 2008-002487  
Application 10/801,944  
Technology Center 2800

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Decided:<sup>1</sup> August 11, 2009

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Before JOSEPH F. RUGGIERO, MARC S. HOFF, and THOMAS S.  
HAHN, *Administrative Patent Judges*.

RUGGIERO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

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<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, begins to run from the Decided Date shown on this page of the decision. The time period does not run from the Mail Date (paper delivery) or Notification Date (electronic delivery).

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-4, 6, 7, 9-13, 15, 16, and 18-20. Claims 5, 8, 14, and 17 have been indicated by the Examiner to be allowable subject to being rewritten in independent form. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

We affirm.

Rather than reiterate the arguments of Appellants and the Examiner, reference is made to the Brief (filed October 30, 2006), the Answer (mailed August 23, 2007), and the Reply Brief (filed October 23, 2007) for the respective details. Only those arguments actually made by Appellants have been considered in this decision. Arguments which Appellants could have made but chose not to make in the Briefs have not been considered and are deemed to be waived (*see* 37 C.F.R. § 41.37(c)(1)(vii) (2008)).

### *Appellants' Invention*

Appellants' invention relates to probe card analysis and, in particular, to the calculation of probe float through optical free-hanging and electrical planarity measurement techniques. The probe float is determined by acquiring a free-hanging planarity measurement, obtaining an electrical contact measurement, and calculating probe float using results of the acquiring and obtaining operations. (*See generally* Spec. 2:2-8).

Claim 1 is illustrative of the invention and reads as follows:

1. A method of calculating probe float; said method comprising:  
acquiring a free-hanging planarity measurement;  
obtaining a first electrical contact planarity measurement; and

calculating probe float using results of said acquiring and said obtaining.

*The Examiner's Rejection*

The Examiner relies on the following prior art reference to show unpatentability:

Harris	US 6,870,382 B2	Mar. 22, 2005 (filed May 3, 2002)
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Claims 1-4, 6, 7, 9-13, 15, 16, and 18-20, all of the appealed claims, stand rejected under 35 U.S.C. § 102(e) as being anticipated by Harris.

ISSUES

The pivotal issues before us in making the determination of whether the Examiner correctly rejected appealed claims 1-4, 6, 7, 9-13, 15, 16, and 18-20 for anticipation are whether Appellants have demonstrated that the Examiner erred in finding that Harris discloses:

- i) the calculation of probe float;
- ii) the acquiring of free-hanging planarity measurements;
- iii) the identification of new free-hanging probes; and
- iv) the use of optical systems for planarity measurements.

FINDINGS OF FACT

The record supports the following relevant findings of fact (FF) by a preponderance of the evidence:

1. Appellants disclose (Fig. 2, Spec. 4:33-5:2) a probe float measuring system in which electrical contact with a probe card 131 at

surface 135 is made through the relative positioning of probe 133 and the contact surface 135.

2. Appellants further disclose (Spec. 5:6-7) that “[t]he range of travel through which probe 133 may be translated linearly in guide 134 prior to contact with surface 135 is referred to as ‘float’.”

3. Appellants also disclose (Spec. 1:24-25 and 4:30-31) that, in the “free-hanging” state, probes are not electrically connected to the probe card.

4. Harris discloses (Fig. 1, col. 6, ll. 20-27) a system for evaluating the planarity of an array of probe tips 48 relative to a die on a wafer 42.

5. Harris also discloses (col. 6, ll. 32-37) the optical measurement of the point of mechanical contact of the probe tip 48 with the die 42 as the wafer chuck 44 is moved in the z-axis direction.

6. Harris further discloses (col. 6, ll. 37-49) that, as the die continues to incrementally move in the z-axis direction, the probe needles 50 of the probe tips 48 are tested for electrical contact with the die bond pad.

7. Also disclosed by Harris (Fig. 2, col. 6, ll. 51-56), is the recording of the data points that represent the shortest distance between the point where electrical contact is made by the probe tip 48 with the die 42 relative to the z-axis reference point where mechanical contact is first made.

#### PRINCIPLES OF LAW

“It is axiomatic that anticipation of a claim under § 102 can be found only if the prior art reference discloses every element of the claim.” *See In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986); *Lindemann Maschinenfabrik GMBH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984).

In rejecting claims under 35 U.S.C. § 102, “[a] single prior art reference that discloses, either expressly or inherently, each limitation of a claim invalidates that claim by anticipation.” *Perricone v. Medicis Pharm. Corp.*, 432 F.3d 1368, 1375 (Fed. Cir. 2005) (citing *Minn. Mining & Mfg. Co. v. Johnson & Johnson Orthopaedics, Inc.*, 976 F.2d 1559, 1565 (Fed. Cir. 1992)). “Anticipation of a patent claim requires a finding that the claim at issue ‘reads on’ a prior art reference.” *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1346 (Fed. Cir. 1999) (“In other words, if granting patent protection on the disputed claim would allow the patentee to exclude the public from practicing the prior art, then that claim is anticipated, regardless of whether it also covers subject matter not in the prior art.”).

“During examination, ‘claims ... are to be given their broadest reasonable interpretation consistent with the specification, and ... claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.’” *In re Am. Acad. of Sci. Tech. Cir.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). “[T]he specification ‘is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1315 (Fed. Cir. 2005) (citations omitted).

## ANALYSIS

### *Claims 1, 2, 4, 9, 10, 11, 13, and 18-20*

Appellants’ arguments in response to the Examiner’s anticipation rejection, based on Harris, of independent claims 1, 9, and 18 assert that the Examiner has not shown how each of the claimed features is present in the

disclosure of Harris so as to establish a prima facie case of anticipation. Appellants' arguments (App. Br. 5; Reply Br. 2-4) initially focus on the contention that, in contrast to the claimed invention, Harris does not disclose a method for calculating probe float. According to Appellants, Harris evaluates probe tip planarity based solely on measurements of the point of first electrical contact of probe tips with a die surface.<sup>2</sup>

We do not find Appellants' arguments to be persuasive of any error in the Examiner's stated position. Appellants' arguments to the contrary notwithstanding, it is apparent to us that Harris is not relying solely on measurements of first electrical probe contact for determining planarity but, rather, it is the z-axis distance that the probes of Harris travel before electrical contact *in relation to a z-axis reference point* that is used as a basis for determining probe tip planarity. (FF 7). As pointed out by the Examiner (Ans. 5 and 8-10), Harris establishes the z-axis reference point through optical measurement of the point at which *mechanical* contact is first made between the probe tips 48 and the die pad. (FF 5).

We further agree with the Examiner (Ans. 10) that the disclosure in Harris (FF 7) of the determination and recording of the shortest distance of travel for each probe tip based on the z-axis travel difference between electrical contact and first mechanical contact, i.e., the z-axis reference point, corresponds to the calculation of probe float as claimed. We find that the Examiner has broadly, but reasonably, interpreted the claim term "probe

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<sup>2</sup> The Rule 132 declaration of John T. Strom, one of the inventors of the present application, filed along with the Reply Brief has not been considered since it is improperly filed after the date of filing of the appeal. See 37 CFR 41.33(d)(2).

float” in accordance with Appellants’ description of the term as that range of travel through which a probe travels before it makes electrical contact. (FFs 1 and 2). See *Phillips*, 415 F.3d at 1315.

We do recognize that Harris does not use the terminology “probe float” in the portion of the disclosure at column 6, lines 20-56 which describes the determination of probe tip planarity. However, the reference need not use the same terms to be within the scope of what is claimed. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

We similarly find to be unpersuasive Appellants’ arguments that Harris does not disclose the acquiring of a free-hanging planarity measurement of a probe as claimed. Appellants do recognize (App. Br. 5-6; Reply Br. 3-4) that Harris does report the z-axis position where mechanical contact occurs for each probe pin but, nonetheless, argue that such does not constitute a planarity measurement for a free-hanging probe.

Referring to our earlier discussion, however, we agree with the Examiner that Harris does not rely solely on measurements of electrical contact of the probe pins to determine planarity but, rather, uses such electrical contact measurements in relation to a z-axis reference point determined by the mechanical contact made by a probe before it travels to make electrical contact. Further, we agree with the Examiner’s finding (Ans. 11) that the determination of first mechanical contact of the probe tips with the die pad is the acquiring of a free-hanging planarity measurement since each probe is in a “free-hanging” state at the time of mechanical contact. This interpretation comports with Appellants’ description of “free-hanging” as referring to probes which are not in electrical contact with the probe card. (FF 3). See *Phillips*, 415 F.3d at 1315.



In view of the above discussion, since Appellants have not demonstrated that the Examiner erred in finding that all of the claimed limitations are present in the disclosure of Harris, the Examiner's 35 U.S.C. § 102(e) rejection of independent claims 1, 9, and 18, as well as dependent claims 2, 4, 10, 11, 13, 19, and 20 not separately argued by Appellants, is sustained.<sup>3</sup>

### *Claims 3 and 12*

The Examiner's anticipation rejection, based on Harris, of dependent claims 3 and 12, which include the feature of identifying new hanging probes, is sustained as well.<sup>4</sup> We find no persuasive arguments (App. Br. 6; Reply Br. 5) from Appellants that demonstrate any error in the Examiner's finding (Ans. 12-13) that the storing and plotting of planarity distance measurements as a result of repetitive incremental z-axis movement of chuck 44 in the direction of the probe tips satisfies the claimed feature of identifying new free-hanging probes. We also make the observation that

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<sup>3</sup> We acknowledge that, at page 5 of the Reply Brief, Appellants have made separate arguments for the patentability of dependent claims 2 and 4. These issues, however, were raised for the first time on appeal in the Reply Brief and are therefore deemed to be waived. *See Optimus Tech., Inc. v. Ion Beam Appl'ns S.A.*, 469 F.3d 978, 989 (Fed. Cir. 2006) ("[A]n issue not raised by an appellant in its opening brief ... is waived.") (citations and quotation marks omitted); *see also Ex parte Scholl*, No. 2007-3653, slip op. at n.13 (BPAI Mar. 13, 2008) (informative), *available at* <http://www.uspto.gov/web/offices/dcom/bpai/its/fd073653.pdf> (same).

<sup>4</sup> While Appellants have included independent claim 18 in the discussion (App. Br. 6) of dependent claims 3 and 12, there are no limitations directed to the identification of new free-hanging probes in claim 18.

since, as discussed earlier, Appellants' Specification describes a "free-hanging" probe as one which has not yet made electrical contact, the incremental z-axis movements in Harris will identify new "free-hanging" probes at the point of mechanical contact but before they have traveled the distance to make electrical contact.

*Dependent claims 6, 7, 15, and 16*

We also sustain the Examiner's anticipation rejection, based on Harris, of dependent claims 6, 7, 15, and 16. Appellants' arguments (App. Br. 6-7; Reply Br. 5) do not convince us of any error in the Examiner's finding (Ans. 6, 13, and 14) that Harris uses an optical system to establish the free-hanging z-axis reference position at the point of mechanical contact. (FF 5).

CONCLUSION

Based on the findings of facts and analysis above, we conclude that Appellants have not shown that the Examiner erred in rejecting claims 1-4, 6, 7, 9-13, 15, 16, and 18-20 for anticipation under 35 U.S.C. § 102(e).

DECISION

The Examiner's decision rejecting claims 1-4, 6, 7, 9-13, 15, 16, and 18-20, all of the appealed claims, under 35 U.S.C. § 102(e) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2007).

AFFIRMED

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